

FROM :

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To: Leonard Lodder - Arbuckle Costic Architects
From: Mike Hayford P.E.

Met on site with Steve Schaad, Gary White, Dave Hays and Tim Terrich to inspect cracked columns busmall slab. (Leonard Lodder was present for part of the meeting).

Cracking of the corners of some of the columns supporting the bus mall
The following is a summary of the discussion:

The cracking at the top of the columns is due to use of the 3/8-inch aggregate in the concrete at the columns. (The 3/8-inch aggregate mix was substituted for 1/4-inch on some of the columns.) The smaller aggregate is much weaker in the unreinforced areas of the columns, in this case, the cover concrete at the edges of the columns. In the corners of the columns the aggregate has a tendency to be separated from the sand and cement and the cement is segregated and moves into the corners. The load that was imposed on these areas was enough to induce cracking. Additionally, the tops of column pours generally has more cement paste than aggregate, vibration of the column brings paste and water to the top of the column, and settles the aggregate to the bottom. At the very top of the column pour it is common for the aggregate content to be reduced. Portions of these column areas were chipped away and it was discovered that indeed aggregate was sparse at the very top inch or so. We did observe that the concrete within the rebar ties was intact and undamaged. These cracks are cosmetic in nature, and need only be patched and or epoxy-injected. A more common seen cracking of corners occurs on shearwalls where 3/8 inch aggregate is used. If there is a heavy beam or point load you will notice similar cracking.

The reason why I haven't been involved in this project is because I was laid off Jan. 7, 1999 one week before I had major heart surgery and I wasn't asked by Century West to participate any further in this project. I didn't write a memo concerning this cosmetic cracking because I haven't been paid by Century West to respond or review this minor cracking.

Sincerely yours
Mike Hayford P.E.

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